The Nature Conservancy
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Date: April 14, 2009
To: Ray Brady, Bureau of Land Management
From: Colorado Field Office Energy Team
Subject: **Solar energy development in the San Luis Valley, Colorado: Key ecological values and highest potential conflicts with natural resource values**

Dear Ray:

At the request of The Nature Conservancy's (TNC) Senior Policy Advisor to BLM, Julie Falkner, we have made an initial attempt to identify (1) key natural resource values in the San Luis Valley (SLV) and (2) some of the highest conflict areas with solar energy development. We appreciate this opportunity to inform BLM's efforts to identify solar energy zones and are excited to contribute to the discussion.

We hope that this exchange marks the beginning of our conversations with BLM about the SLV, and would value the chance to explore more deeply the opportunities and challenges for solar energy development in this ecologically significant area. As BLM is aware, zoning for solar energy development is a highly complex topic that warrants careful thought. This document represents a starting point of key considerations from the Conservancy's perspective.

I. Key Ecological Values in the San Luis Valley

In general, we would urge BLM to first and foremost take into account the species and vegetation values below when identifying solar energy zones in the SLV:

- **Large and intact blocks of vegetation such as sagebrush**. The maintenance of large and functional blocks of vegetation is a prudent approach to the conservation of sensitive wildlife and other species. It has been shown in many studies that surface disturbance by roads and land conversion (such as to solar energy development) leads to changes in species composition and population size. The SLV contains many large and relatively intact patches of systems such as winterfat shrublands, greasewood shrublands, stabilized dune shrublands and grasslands, sagebrush shrublands, and large wetlands. Any development of solar energy infrastructure should take these ecological systems into account and design activities such that it minimally impacts them.

- **Riparian areas.** The San Luis Valley is the headwaters of the Rio Grande River. Its waters are critical for the wildlife, plant communities, and the people of the Valley. The headwaters are relatively isolated by geography and therefore support several fish species that are endemic or nearly so to the area (Rio Grande Cutthroat Trout, Rio Grande Sucker, and the Rio Grande Chub). The riparian areas of some portions of the river

B-017-001: Comment Noted (In Review)

Your email/letter/comment form has been received and your comment noted.

The Environmental Impact Statement is anticipated to be completed in late 2010 and will be available at http://www.usda.gov/rus/water/ees/ea.htm.

support the listed Southwestern Willow Flycatcher. The upper end of the San Luis Valley is a closed basin and supports some of the most extensive aquifers in the entire region. The high water table supports extensive wetlands that are important for many wetland-associated species. Many of these once more extensive wetlands are now altered by human land use, making the remaining wetlands of even greater significance. Developments of any kind should protect the rivers, streams, riparian areas, wetlands, and ecological services of these important resources.

- **Irreplaceable species and communities and the areas necessary to support them.** We consider "irreplaceable" species and natural communities to be those that are ranked as *critically imperiled* or *imperiled* by the Colorado Natural Heritage Program (CNHP) and NatureServe.[1] These species and communities, due to their very rarity, are relatively vulnerable to extinction. Such species include but are not limited to a number of BLM Special Status Species. Examples of irreplaceable species in the SLV include the Rio Grande cutthroat trout, the Gunnison sage-grouse and the Great Sand Dunes tiger beetle.

- **Selected other important wildlife habitats.** All of the above values can be considered wildlife habitats. However, they do not directly address the places needed for species' life cycles which are also important to consider. The Colorado Division of Wildlife has mapped many key habitats. Examples include production areas and summer concentration areas for bighorn sheep and roosting areas for bald eagles.

- **Places that are important to many of the aforementioned values combined**. It is important to consider the combined values of species and vegetation – not just the individual values alone. "The sum of the whole is greater than its parts," so the saying goes. For example, an area that is important to bald eagles, bighorn sheep, one or more rare plants, and is part of a large and intact patch may pose higher conflicts for solar energy development than an area that is important for just one or two of those values. In such areas the design of infrastructure is challenging, but highly important.

We would welcome the opportunity to work with BLM and others in considering how best to incorporate these considerations in order to avoid, minimize, and potentially mitigate environmental impacts associated with solar energy development.

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1 From the CNHP website: **Critically Imperiled** - Typically 5 or fewer occurrences or less than 1000 remaining individuals. **Imperiled** - Typically 6 to 20 occurrences or between 1,000 and 3,000 remaining individuals. (http://www.cnhp.colostate.edu/heritage.html) .

II. Highest conflict areas in the San Luis Valley

As a first step toward addressing the values above, we attempted to delineate areas within the San Luis Valley where the development of solar energy could dramatically conflict with areas of significant and potentially irreplaceable natural resource values. See map attached.

Since the entire Valley floor appears to be high potential for solar development, we identified the key potential conflicts throughout the Valley and beyond that we believe to be most significant from an ecological/conservation perspective based on a preliminary analysis, and for which we had available data. The map includes the following areas, see Attachment 2 for rationale:

- Bald eagle roost sites and winter concentration areas
- Bighorn sheep production areas and severe winter range
- Gunnison sage-grouse production Areas, severe winter Range, winter Range, and overall range
- Globally imperiled plants and natural communities as ranked by CNHP
- Riparian areas
- Potential Conservation Areas as identified by the CNHP
- Sandhill crane habitat

In general, these highest values represent species, habitats, or locations which, if significantly altered, might greatly increase the impacts to a species or suite of species, thereby increasing the chances of extinction or extirpation. In other cases the risk would be to a recognized population rather than a species per se. The analysis is not comprehensive or exhaustive but limited to those areas and instances where solar energy development could have particularly significant impacts. See Attachment 3 for the full list of maps we considered for this initial exercise, which also represent layers that could be incorporated into a more thorough analysis.

The map of highest conflicts is a starting point. Outside this initial identification of "high potential conflict" areas lie regions of lesser conflict that will require deeper analysis and consideration of impacts to an accumulation of overlapping conservation interests and priorities. Theoretically, overlapping areas of lower conflict could result in additional high conflict areas. For example, although we did not believe that certain important values (e.g., elk winter range, large and intact blocks of habitat, etc.) warranted the distinction of "highest conflict" in and of themselves, these values combined could represent high conflict zones.

III. Other opportunities in the San Luis Valley

We have identified initial high conflict areas because of key ecological values. We have also indicated that other areas not included in the map might be high conflict areas when considering a combination of values. Importantly there are other highly important ecological values that could be impacted, but are not indicated herein because we believe that careful consideration and design practices will provide for acceptable development. The most important considerations would be for impacting the smallest area possible, co-development with existing impacts, and minimizing fragmentation or secondary impacts. We look forward to working with the BLM or any party that would include this type of best science and best practices in the development of our important energy resources.

Please feel free to contact us with any questions. We would welcome any feedback and the opportunity to converse with you about this important endeavor.

Best regards,

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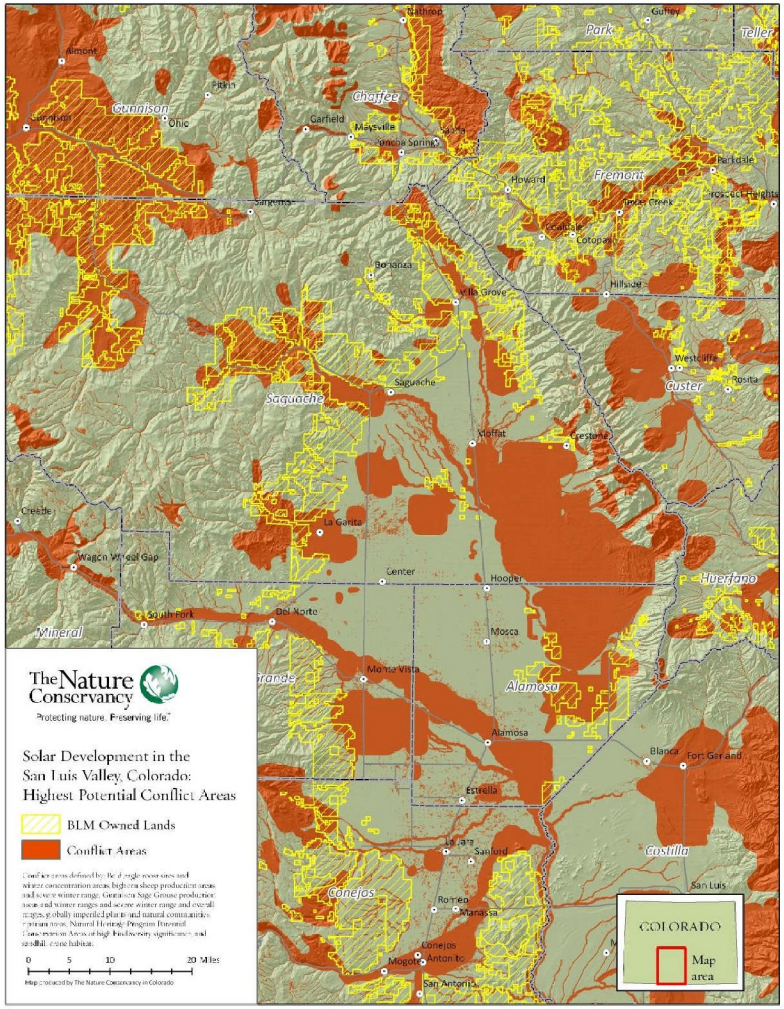
Attachment 1. Map of highest potential conflict areas in the San Luis Valley



Attachment 2. Sources of the highest conflict areas as identified on the map

This table describes each input to the high conflict map.

Areas included in the map	Rationale
Sandhill crane habitat, as represented by a 1-mile buffer around the Baca National Wildlife Refuge and conservation easements	Although a rough estimation, the area includes stopover habitat during spring and fall migrations for the entire Rocky Mountain population of sandhill cranes.
Riparian areas, as represented by a buffer of 500 ft on either side of the center line of streams (perennial and intermittent).	Includes all perennial, intermittent, etc. There are several rare or imperiled and priority fish species in the area, habitat for the Southwest Willow Flycatcher, rare plant habitat, known populations of Northern Leopard Frogs, and important wetlands in the area. Best management practices and conservation science strongly suggests that avoidance of not just the wetlands area, but a significant upland area is important to retaining species, natural communities, and ecosystem services of aquatic habitats. Note that 500' on either side of the streams is a rough indicator and could be larger or smaller depending on stream size, presence of selected species, existing land use, and other factors.
Potential Conservation Areas ranked as B1 and B2	CNHP delineates Potential Conservation Areas as a first estimation of the area needed to conserve the focal species or community for which the area was designed. By the areas that CNHP has ranked as highest for their biological significance (B1 and B2), we have selected those areas designed for the most rare/imperiled species or natural communities. Compromising these areas could increase the chances of losing a species or one of a small number of populations.
Globally imperiled (G1 and G2) rare plants and natural communities	These are the most rare and imperiled examples of plants, animals, and natural communities. Alteration of these populations could result in a greater likelihood of extinction or extirpation – also increasing the chances of the species being listed under the Endangered Species Act.
Bald Eagle Roost Sites	Bald eagles depend on relatively secluded and safe areas for roosting, particularly in the winter. Such areas can be limiting and are therefore included as exclusion zones.
Bald Eagle Winter Concentration Areas	Bald eagles congregate near predictable food supplies during the often stressful winter season. Such areas have a disproportional influence on winter survival.
Bighorn Production Areas	Bighorn sheep populations are scattered and generally small in the Southern Rocky Mountains. They are also susceptible to disease, disturbance, and hard winters. Production areas are key to population success.
Bighorn Severe Winter Range	Highly stressful conditions can occur in the Southern Rocky Mountains during winter, increasing mortality from disease,

Areas included in the map	Rationale
	starvation, and predation. Loss of areas known by sheep bands as severe winter range can have large impacts to populations.
Gunnison Sage Grouse Production Area	These areas are already designated by BLM as Restricted Surface Occupancy. The Gunnison Sage-grouse is among the most imperiled species in North America. This species is highly sensitive to habitat disruption and the erection of upright structures. Avoidance of its habitat is considered a key conservation strategy, particularly in areas near the lekking grounds.
Gunnison Sage Grouse Severe Winter Range	The Gunnison Sage-grouse is among the most imperiled species in North America. This species is highly sensitive to habitat disruption and the erection of upright structures. Avoidance of its habitat is considered a key conservation strategy, especially for areas considered to be safe-havens during harsh winters.
Gunnison Sage Grouse Winter Range	Same as above.
Gunnison Sage Grouse Overall Range	Same as above. Note also: this layer may be a compilation of the above Gunnison Sage-grouse habitat types; however, it may be larger and include areas recently vacated by the grouse, but suitable and important for grouse recovery.
Gunnision prairie dog colonies – active	We don't have these data yet, but hope to collect it. Candidate for listing in this part of the range including the entire relevant part of the Southern Rocky Mountain Ecoregion. Disruption or removal of these colonies may increase the risk to this species, making a listing more likely.
Gunnision prairie dog colonies – unknown	We don't have digital data for this category at this time, but hope to collect it soon. These prairie dog colonies were known to be occupied but the current status is unknown. They are important components of the suitable habitat and possibly the population of the Gunnison's prairie dog.

Attachment 3. Full suite of available map layers that we considered.

As a next step, BLM and/or TNC and other partners could choose from among these layers to complete a more thorough analysis of important areas for natural resources and associated potential conflicts with solar energy development.

GIS layers available	Included in map of highest conflicts?
Places important to many of the values below	
Ecoregional conservation areas as identified by The Nature Conservancy	Not at this time, however, inclusion in these areas strongly suggests a need to include the strongest conservation design principles.
Large and intact patches of ecological systems	
Biggest and best patches in the Southern Rocky Mountains ecoregion (which includes the San Luis Valley)	Not at this time
Riparian and aquatic	
Riparian areas, as represented by a buffer of 500 ft. on either side of the center line of streams (perennial and intermittent).	Yes. We concluded that a rough estimate would be 500' on either side of a stream of any size. This may underestimate the area on larger streams and overestimate the needed area on the smallest streams.
Irreplaceable species (rare plants and natural communities)	
Rare plants and natural communities ranked as G1 and G2	Yes. Where available, the "buffer" would be similar to the applicable potential conservation area designed for this species or occurrence unless other information is available
Rare plants and natural communities ranked as G3	Not at this time
Potential Conservation Areas ranked as B1 and B2	Yes
Potential Conservation Areas ranked as B3	Not at this time
Other important wildlife values	
Bald eagle active nest sites	Not at this time
Bald eagle roost sites	Yes
Bald eagle summer forage	Not at this time
Bald eagle winter concentrations	Yes
Bald eagle winter forage	Not at this time

GIS layers available	Included in map of highest conflicts?
Bald eagle winter range	Not at this time
Bald eagle winter roost sites	Not at this time
Bighorn migration corridors	Not at this time
Bighorn migration patterns	Not at this time
Bighorn mineral licks	Not at this time
Bighorn overall range	Not at this time
Bighorn production areas	Yes
Bighorn severe winter range	Yes
Bighorn summer concentration areas	Not at this time
Bighorn summer range	Not at this time
Bighorn water sources	Not at this time
Bighorn winter concentration areas	Not at this time
Bighorn winter range	Not at this time
Bighorn winter range	Not at this time
Cutthroat trout habitat - designated	Not at this time*. In particular, occupied or designated restoration zones.
Elk highway crossings	Not at this time
Elk limited use areas	Not at this time
Elk migration corridors	Not at this time
Elk migration patterns	Not at this time
Elk overall range	Not at this time
Elk production areas	Not at this time
Elk resident population area	Not at this time
Elk severe winter range	Not at this time
Elk summer concentration areas	Not at this time
Elk summer range	Not at this time
Elk winter concentration areas	Not at this time
Elk winter range	Not at this time
Gunnision pdog colonies – active	Not at this time.* The Rocky Mountain population of this species was recently designated as a candidate for listing.
Gunnision pdog colonies – inactive	Not at this time
Gunnision pdog colonies – unknown	Not at this time*
Gunnison sage-grouse overall range	Yes
Gunnison sage-grouse production areas	Yes
Gunnison sage-grouse severe winter range	Yes

GIS layers available	Included in map of highest conflicts?
Gunnison sage-grouse winter range	Yes
Mule deer concentration area	Not at this time
Mule deer critical winter range	Not at this time
Mule deer highway crossing	Not at this time
Mule deer limited use areas	Not at this time
Mule deer migration corridors	Not at this time
Mule deer migration patterns	Not at this time
Mule deer overall range	Not at this time
Mule deer resident population areas	Not at this time
Mule deer severe winter range	Not at this time
Mule deer summer range	Not at this time
Mule deer winter concentration areas	Not at this time
Mule deer winter range	Not at this time
Pronghorn concentration areas	Not at this time
Pronghorn limited use areas	Not at this time
Pronghorn migration corridors	Not at this time
Pronghorn overall range	Not at this time
Pronghorn perennial water	Not at this time
Pronghorn resident population area	Not at this time
Pronghorn severe winter range	Not at this time
Pronghorn winter concentration areas	Not at this time
Pronghorn winter range	Not at this time
Raptor active nest sites (bald and golden eagles, ferruginous hawk, osprey, northern goshawk, peregrine and prairie falcons	Not at this time
Sandhill crane habitat as represented by a 1-mile buffer of wildlife refuge and conservation easements (1 mile)	Yes. This is a rough estimate but is likely to protect the critical roosting area of the crane population.

* Maps exist for these features but we do not have them at present. If we did have the maps, we would have included them in the map of highest conflicts.